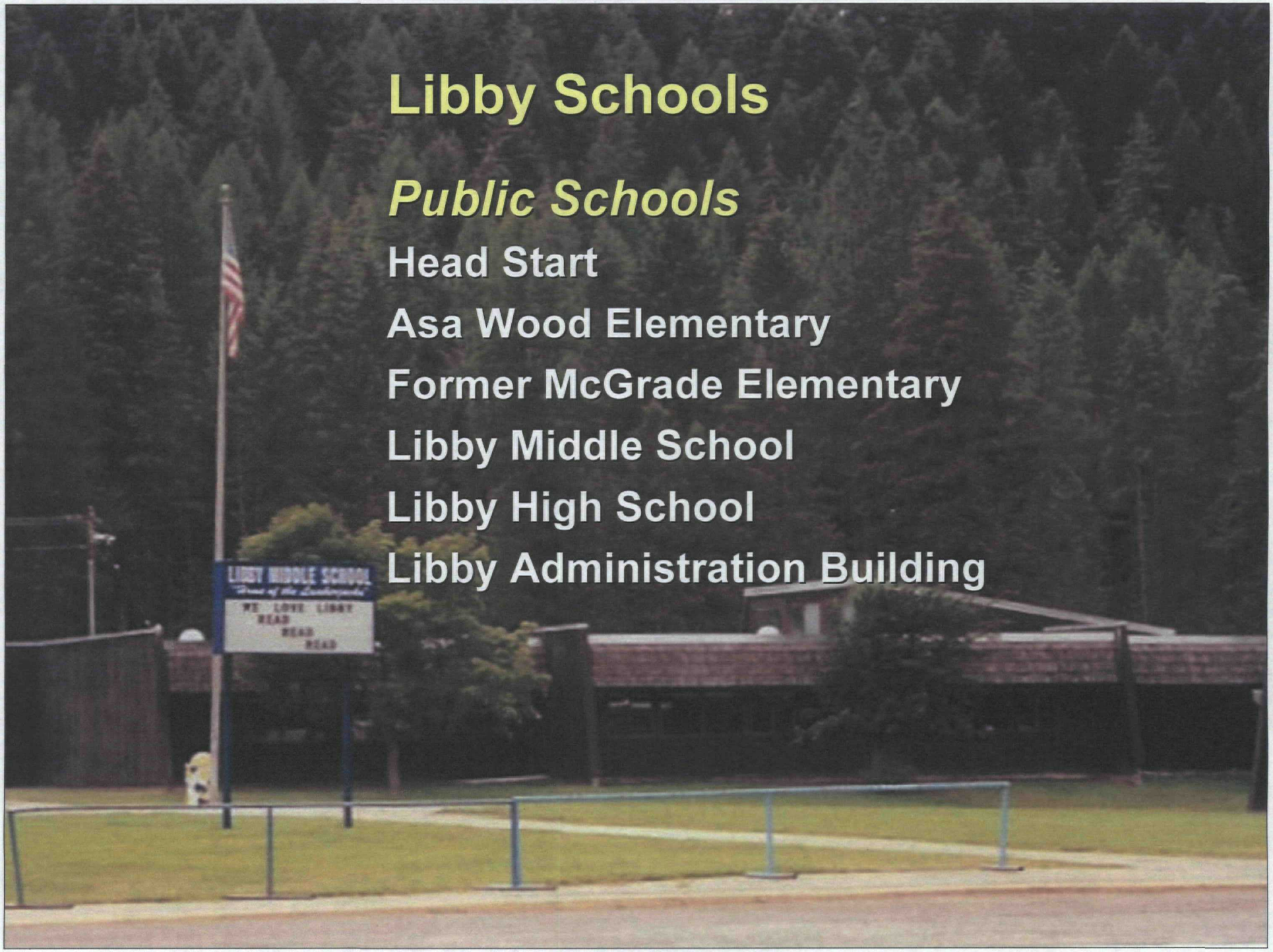
Summary of Libby Public School Sampling Results, Removal Actions, and 2008 Planning

Libby Superfund Site

November 2008



Libby Schools

Public Schools

Head Start

Asa Wood Elementary

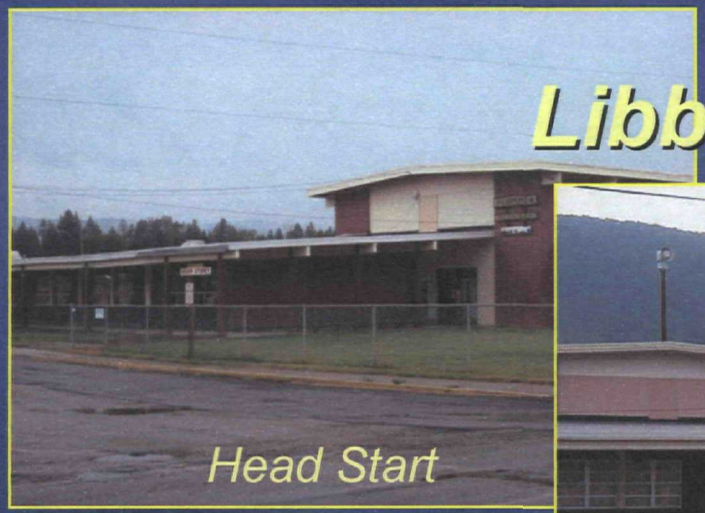
Former McGrade Elementary

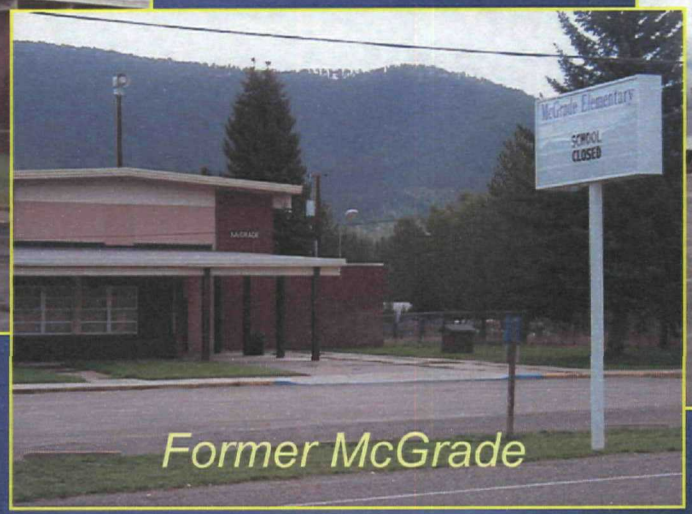
Libby Middle School

Libby High School

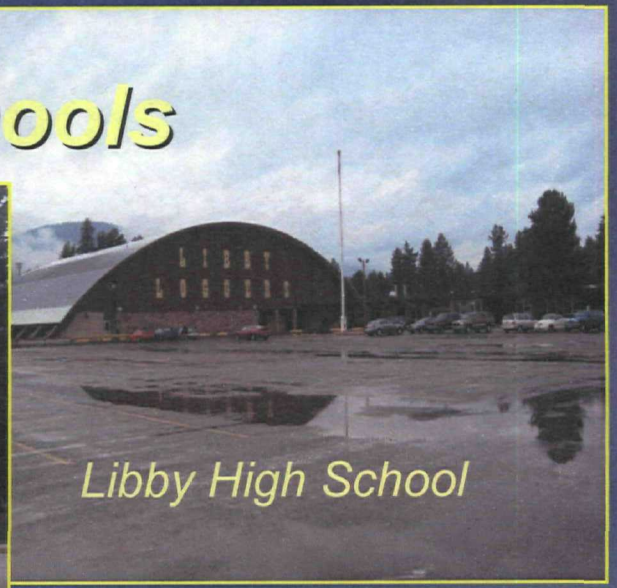
Libby Administration Building

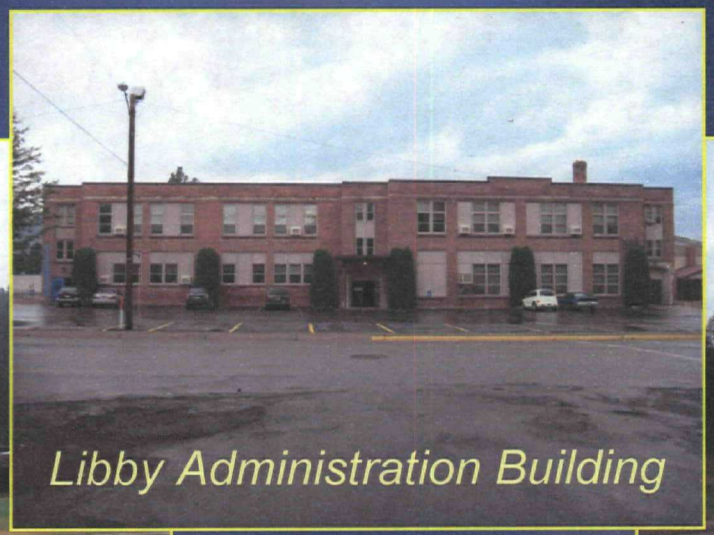
Libby Public Schools

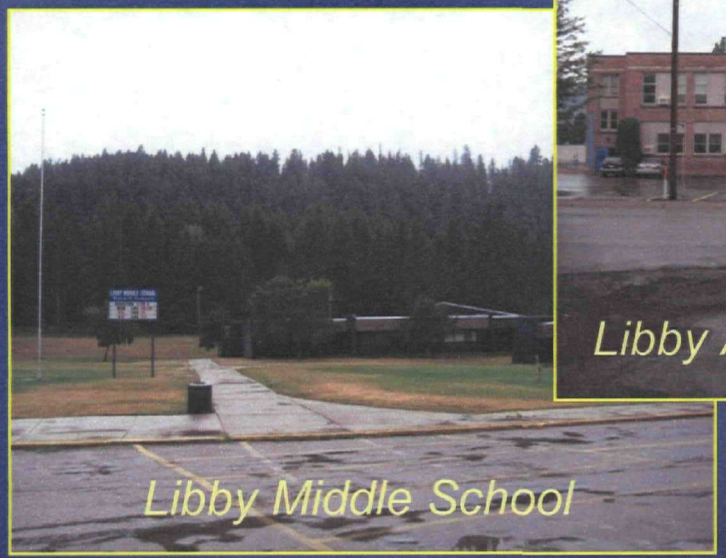

Head Start

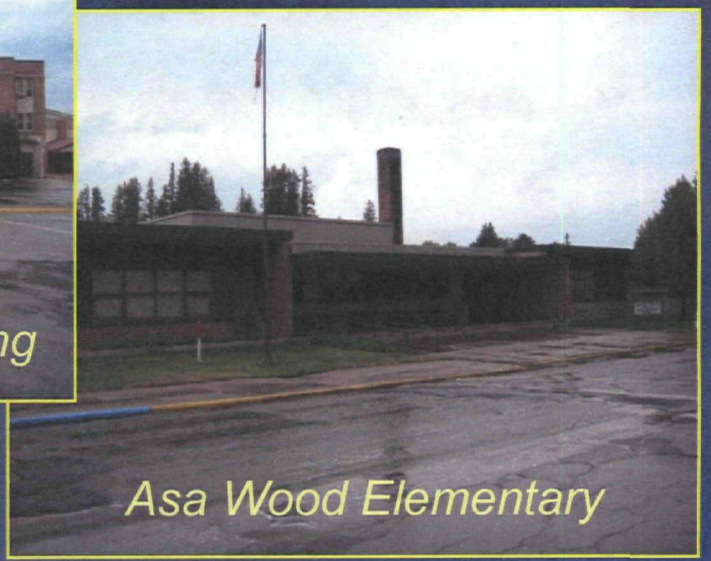


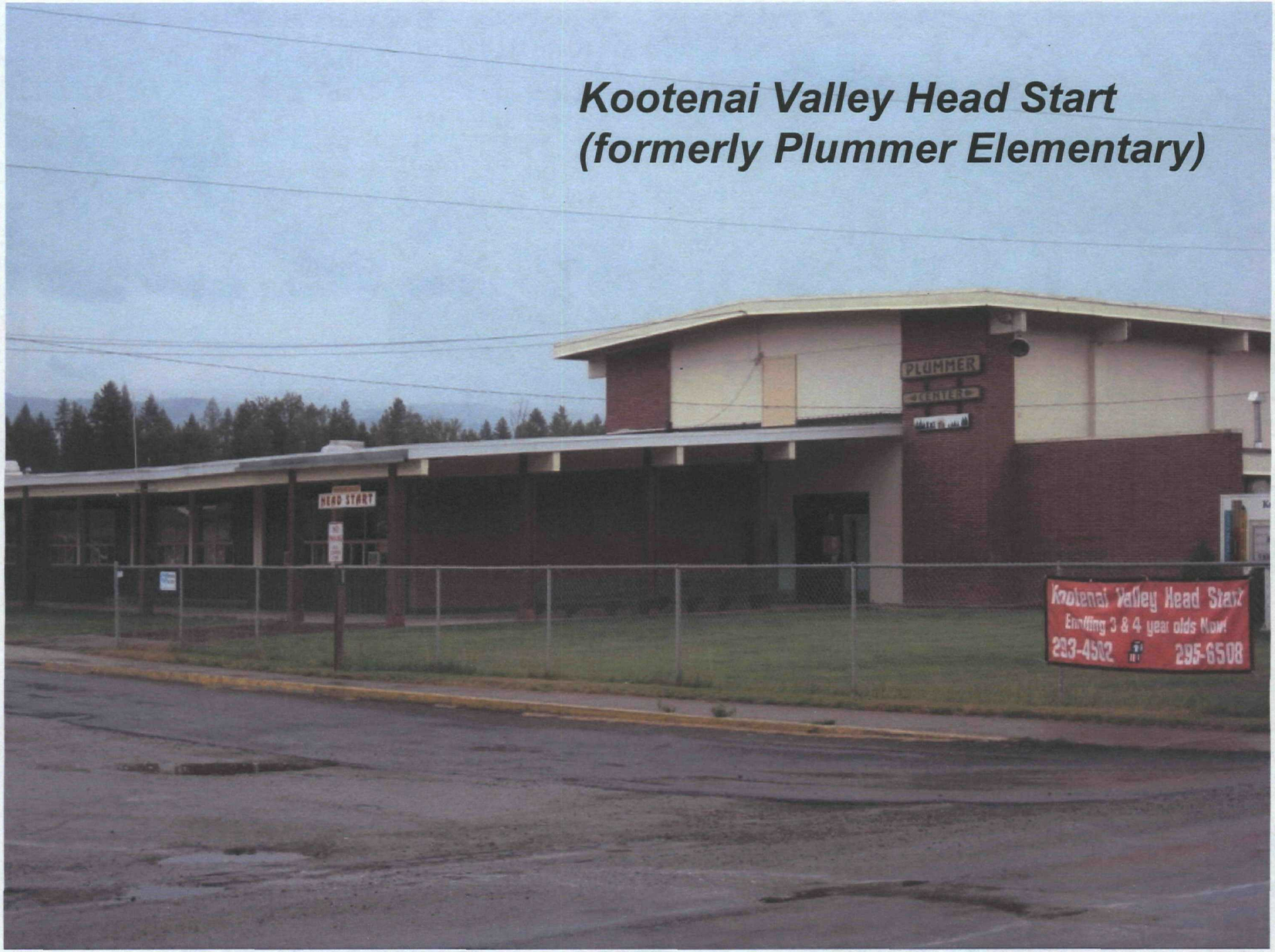
Former McGrade


Libby High School


Libby Administration Building


Libby Middle School


Asa Wood Elementary


Kootenai Valley Head Start
(formerly Plummer Elementary)
PLUMMER
HEAD START
Kootenai Valley Head Start
Enrolling 3 & 4 year olds Now!
293-4502
295-6508

Head Start (formerly Plummer Elementary) – Historical Investigation Results

Media	Date	# of Samples Collected	# and % of Samples with Detects				Analytical Method	Results and Sensitivity Range	
			LA	%	C	%		LA	C
Air	1/2000	4	0	0%	1	25%	TEM ISO 10312	ND (Sen: 0.0007 S/cm^3)	0.7938 s/cm^3 (1S) (Sen: 0.0007 S/cm^3)
Bulk	No Suspect Material Observed								
Dust	1/2000	4	0	0%	1	25%	TEM ISO 10312	ND (Sen: 32 – 26,769 S/cm^2)	1,836 s/cm^2 (57S) (Sen: 32 – 26,769 S/cm^2)
Soil	3/2001 to 6/2001	52	10	19%	0	0%	All by 9002 then NDs by PLM-VE	43 ND by PLM-VE 6 <1% by 9002 3 >1% by 9002 1 TR by PLM-VE	ND

Head Start (formerly Plummer Elementary) – 2008 Investigation Results

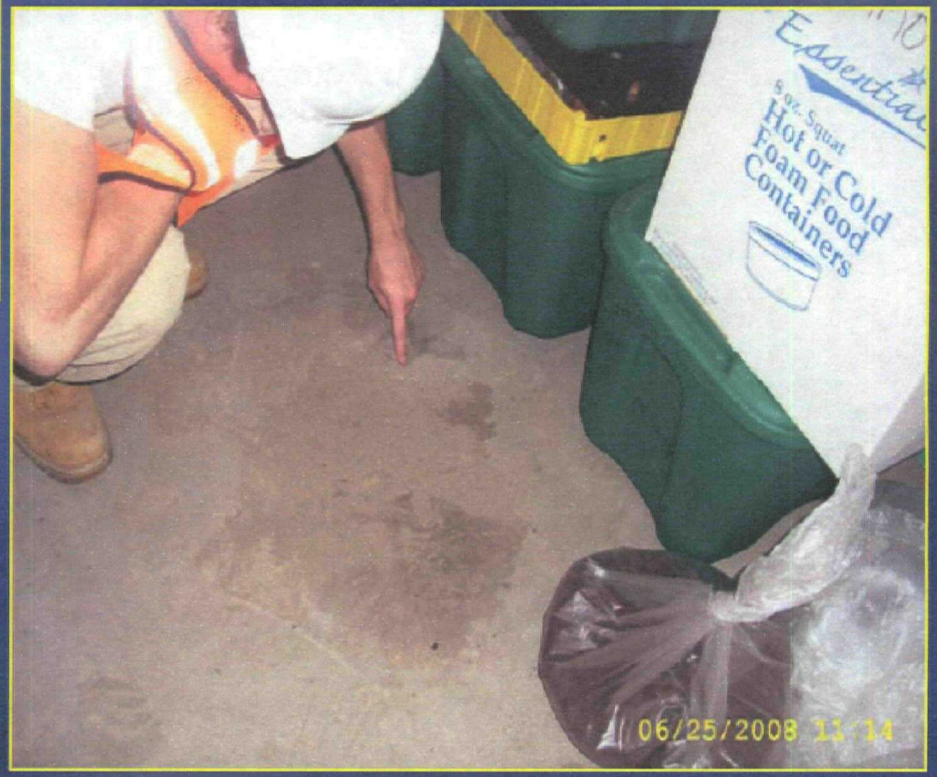
Indoor Results	• Unexpanded vermiculite at moderate levels was observed in two, five-gallon buckets of sand in a storage room of the main gym area. One of the buckets had three toy shovels in it and a small quantity of sand was spilled on the floor nearby. •Vermiculite was also observed in the soil of a potted plant in the northwest office.
Outdoor Results	•No observations of vermiculite or insulation leaking from exterior walls

Notes: LA – Libby Amphibole; C – Chrysotile; TEM – transmission electron microscopy; ISO – International Organization of Standardization; ND – Non-detect; s/cm^3 – structures per cubic centimeter; s/cm^2 – structures per square centimeter; S – structure count; 9002 – PLM Method NIOSH 9002; PLM-VE – polarized light microscopy by visual estimation; TR – trace (<0.2%); > - greater than; < - less than; % - percent; Sen - analytical sensitivity; Indicates removal action taken based on result or observation.

1-02714
1-02711
1-02707
1-02696
1-02194
1-02195
Legend
surface soil sample - ND for LA
surface soil sample - TR LA
surface soil sample - < 1% LA
surface soil sample - >= 1% LA
The OU boundaries depicted are based on the definitions found in the Libby Asbestos Conceptual Site Model, Revision 19. Because investigation of the nature and extent of contamination continues, the OU boundaries are subject to change. These OU boundaries are current as of August 2008.
N
W
E
S
Scale of Feet
0 50 100 200
1 inch equals 100 feet
Head Start Investigation Sample Results
Libby Asbestos Project
Libby, Montana
CDM
Document: R:\2603-Volpe\Libby\GIS\FigureX_HeadStart_InvestigationSamples.mxd

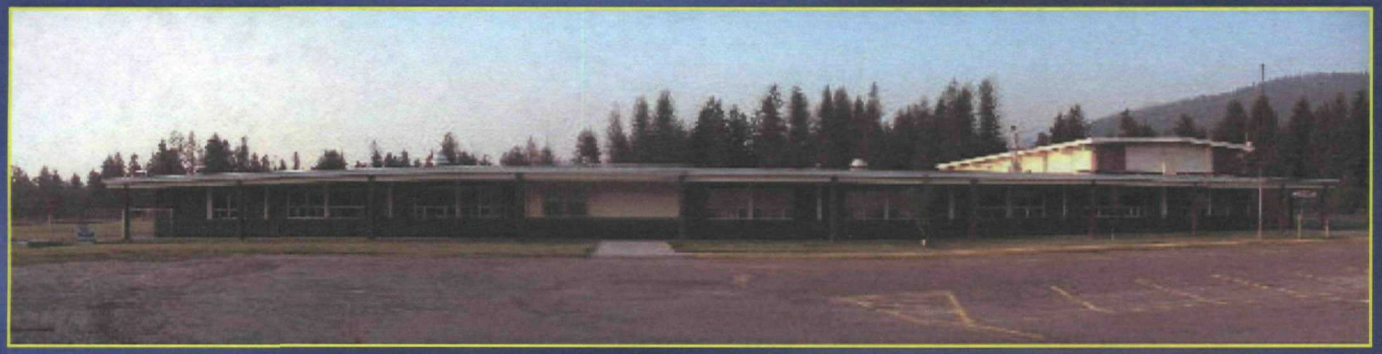
Head Start (Formerly Plummer Elementary): 2008 Observations

Five gallon buckets with moderate amounts of vermiculite observed and toy shovels.



Sand spilled with moderate levels of vermiculite.

Head Start (formerly Plummer Elementary) – Resulting Actions		
Media	**Detection Frequency**	**Resulting Action**
Air	0/4	No Action Required
Bulk	2008: Sand with Moderate Vermiculite Observed	No Action Required ERS removal activity conducted to remove sand and vermiculite in 2008
Dust	0/4	No Action Required
Soil	10/52	July 2001: Removed soil from former ice rink area October 2002: Removed soil from former pond area



Head Start (Formerly Plummer Elementary): Removal Actions

Removal performed to cleanup vermiculite found at depth.

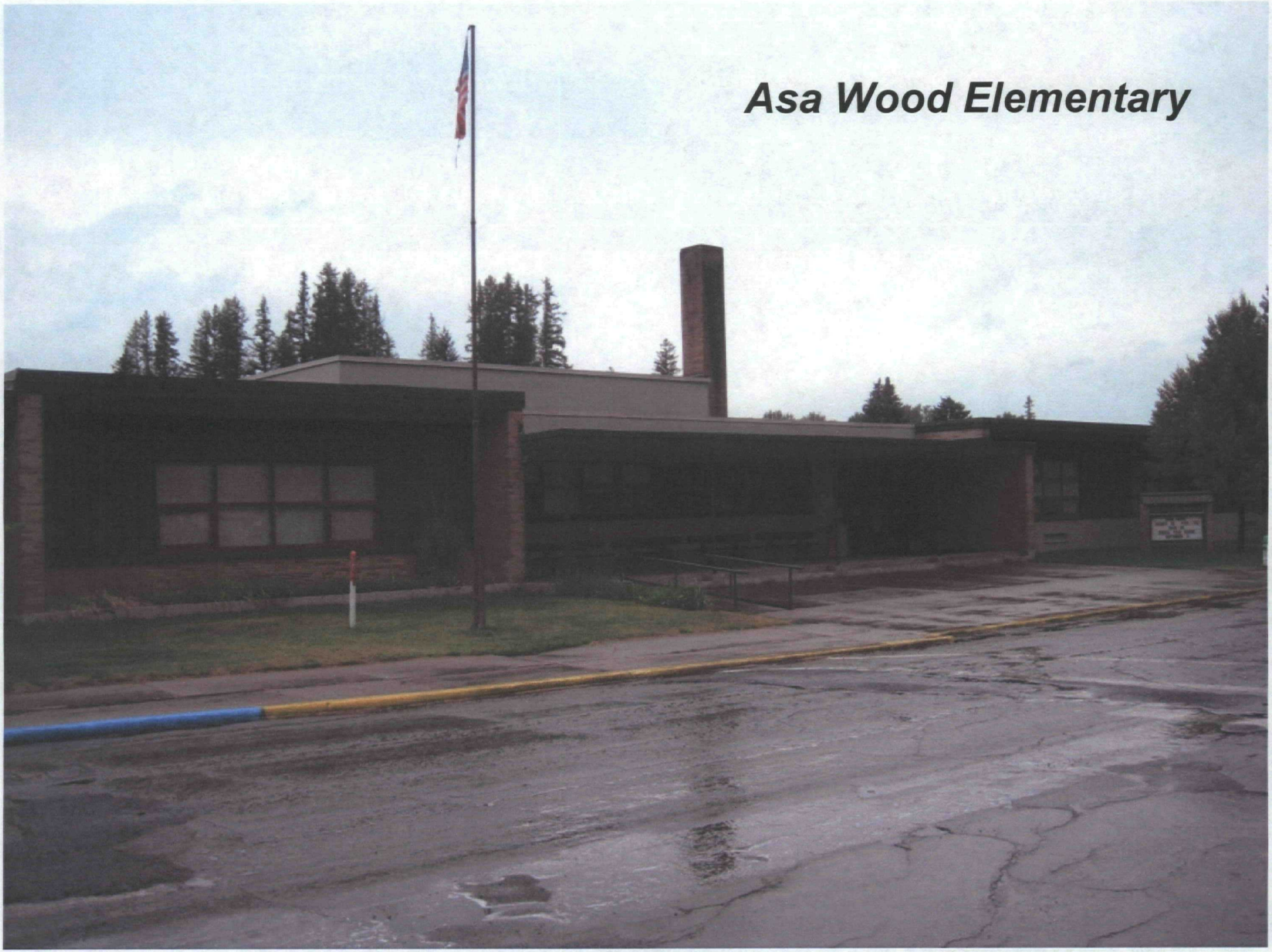
Removal performed to cleanup vermiculite found at depth.


Legend
Removal Areas
The OU boundaries depicted are based on the definitions found in the Libby Asbestos Conceptual Site Model, Revision 19. Because investigation of the nature and extent of contamination continues, the OU boundaries are subject to change. These OU boundaries are current as of September 2008.
N
W
E
S
Scale of Feet
0 50 100 200
1 inch equals 100 feet
Head Start Removal Actions
Libby Asbestos Project
Libby, Montana
CDM
Document: R:\2603-Volpe\Libby\GIS\FigureX_HeadStart_RemovalActions.mxd

Head Start (Formerly Plummer Elementary): Removal Actions

Removal performed to cleanup vermiculite found along wall in parent's waiting room.

Vermiculite encountered during ERS cleanup activities and suspected to have come from the exterior wall.


Asa Wood Elementary

Asa Wood Elementary – Historical Investigation Results

Media	Date	# of Samples Collected	# and % of Samples with Detects				Analytical Method	Results Range	
			LA	%	C	%		LA	C
Air	1/2000	5	0	0%	0	0%	TEM ISO 10312	ND (Sen: 0.0007 – 0.0008 S/cm^3)	ND (Sen: 0.0007 – 0.0008 S/cm^3)
Bulk	1/2000	No Suspect Building Material Observed							
Dust	1/2000	6	0	0%	2	33%	TEM ISO 10312	ND (Sen: 32 – 26,979 S/cm^2)	3,221 s/cm^2 (1S) to 43,167 s/cm^2 (8S) (Sen: 32 – 26,979 S/cm^2)
Soil	3/2000	13	NA		NA		NA	Archived	
	6/2001	31	5	16%	0	0%	All by 9002 then NDs by PLM-VE	26 ND by PLM-VE 3 TR by PLM-VE 2 <1% by 9002	ND

Asa Wood Elementary – 2008 Investigation Results

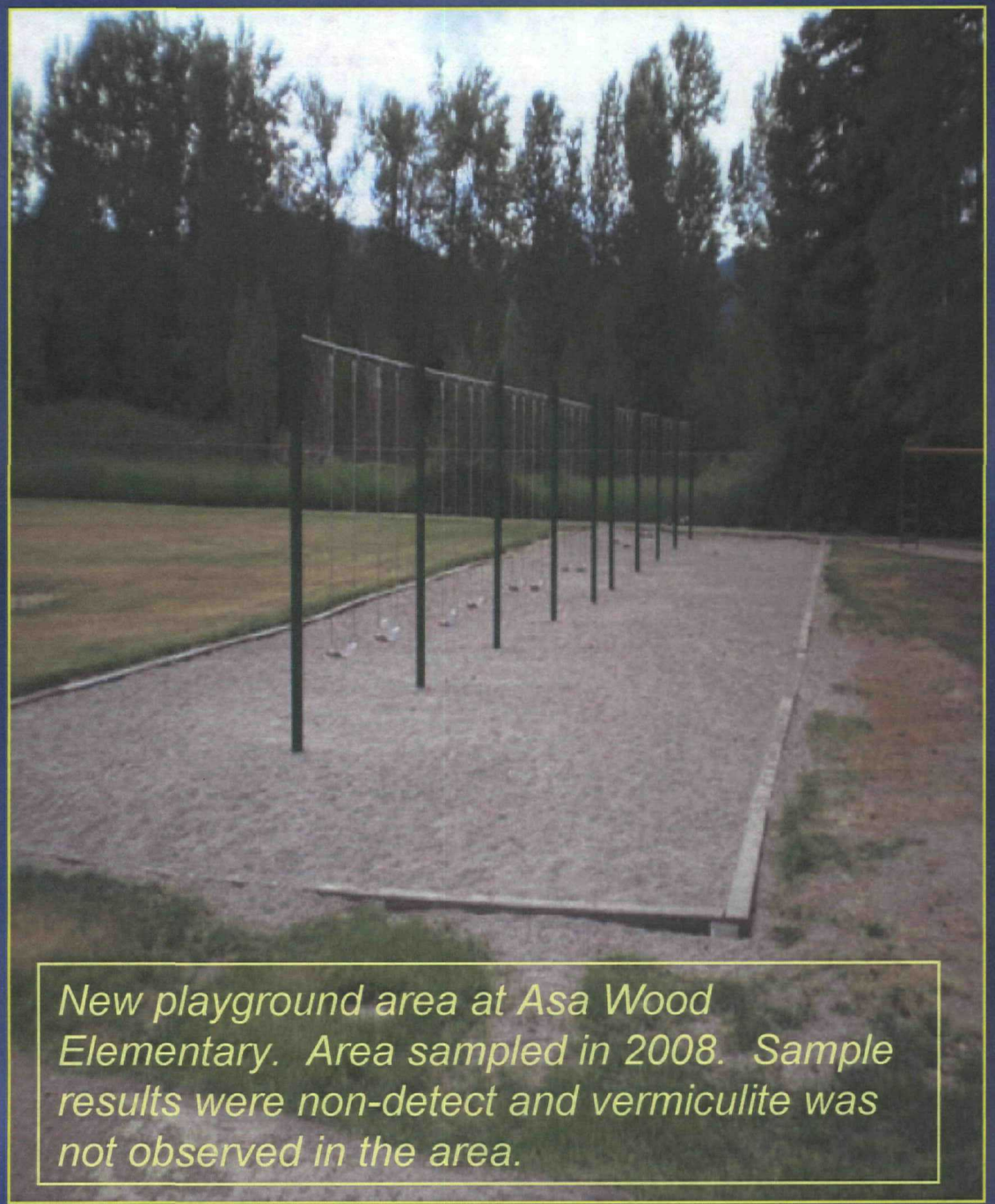
Indoor Results	•VCBM observed in wall plaster in reading room and near stage. Found in good condition and non-friable. •VCI observed in cinder block wall as the result of puncture from forklift in 2/2008
Outdoor Results	•Walking path: samples collected (16 – ND, 2 – TR by PLM-VE) and VV inspections conducted (1 "low" in each of 5 samples) every 150 feet •New playground: One sample collected (ND) and VV inspections conducted (none observed) •2001 sample locations: VV inspections conducted from 5 areas where samples were <1% or TR (3 "lows" at one location)

Notes: LA – Libby Amphibole; C – Chrysotile; TEM – transmission electron microscopy; ISO – International Organization of Standardization; ND – Non-detect; s/cm^2 – structures per square centimeter; S – structure count; 9002 – PLM Method NIOSH 9002; PLM-VE – polarized light microscopy – visual estimation; TR – trace (<0.2%); < - less than; % - percent; VV – visual vermiculite; VCBM – vermiculite containing building material; VCI – vermiculite containing insulation; Sen – analytical sensitivity

Asa Wood Elementary – Resulting Actions		
Media	**Detection Frequency**	**Resulting Action**
Air	0/5	No Action Required
Bulk	No Suspect Building Material Observed 2008: Forklift Punctured Cinder Block Wall Exposing VCI	No Action Required 2008: Spill Location Cleaned Up
Dust	0/6	No Action Required
Soil	5/31	No Action Required; Below Cleanup Criteria

Summary of Visual Vermiculite Observations at Asa Wood Elementary School in 2008

Location	Total Number of PIs	Relative Amount of Vermiculite Observed			
		None	Low	Medium	High
School Yard	540	535 99.07%	5 0.93%	0 0.00%	0 0.00%



New playground area at Asa Wood Elementary. Area sampled in 2008. Sample results were non-detect and vermiculite was not observed in the area.

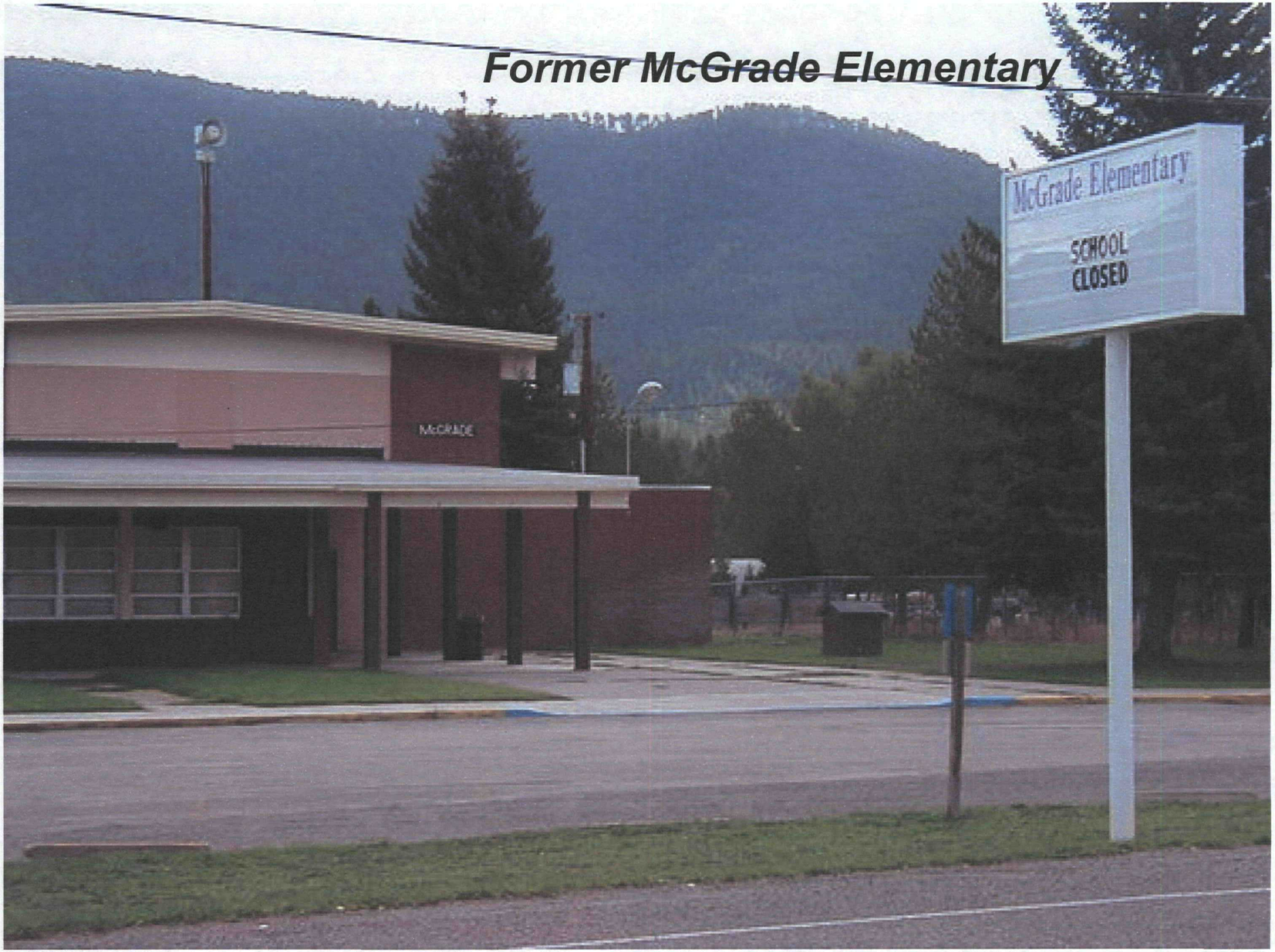
Asa Wood Elementary: Removal Actions

Vermiculite insulation spilled from Asa Wood when wall was damaged by snow removal equipment

EPA Contractors conducted emergency removal action to repair hole and remove spilled vermiculite and vermiculite containing snow/soil


Legend
Spill Location
The OU boundaries depicted are based on the definitions found in the Libby Asbestos Conceptual Site Model, Revision 19. Because investigation of the nature and extent of contamination continues, the OU boundaries are subject to change. These OU boundaries are current as of September 2008.
N
W
E
S
Scale of Feet
0 50 100 200
1 inch equals 100 feet
Asa Wood Elementary Removal Actions
Libby Asbestos Project
Libby, Montana
CDM
Document: R:\2603-Volpe\Libby\GIS\FigureX_AsaWoodElementary_RemovalActions.mxd

Former McGrade Elementary

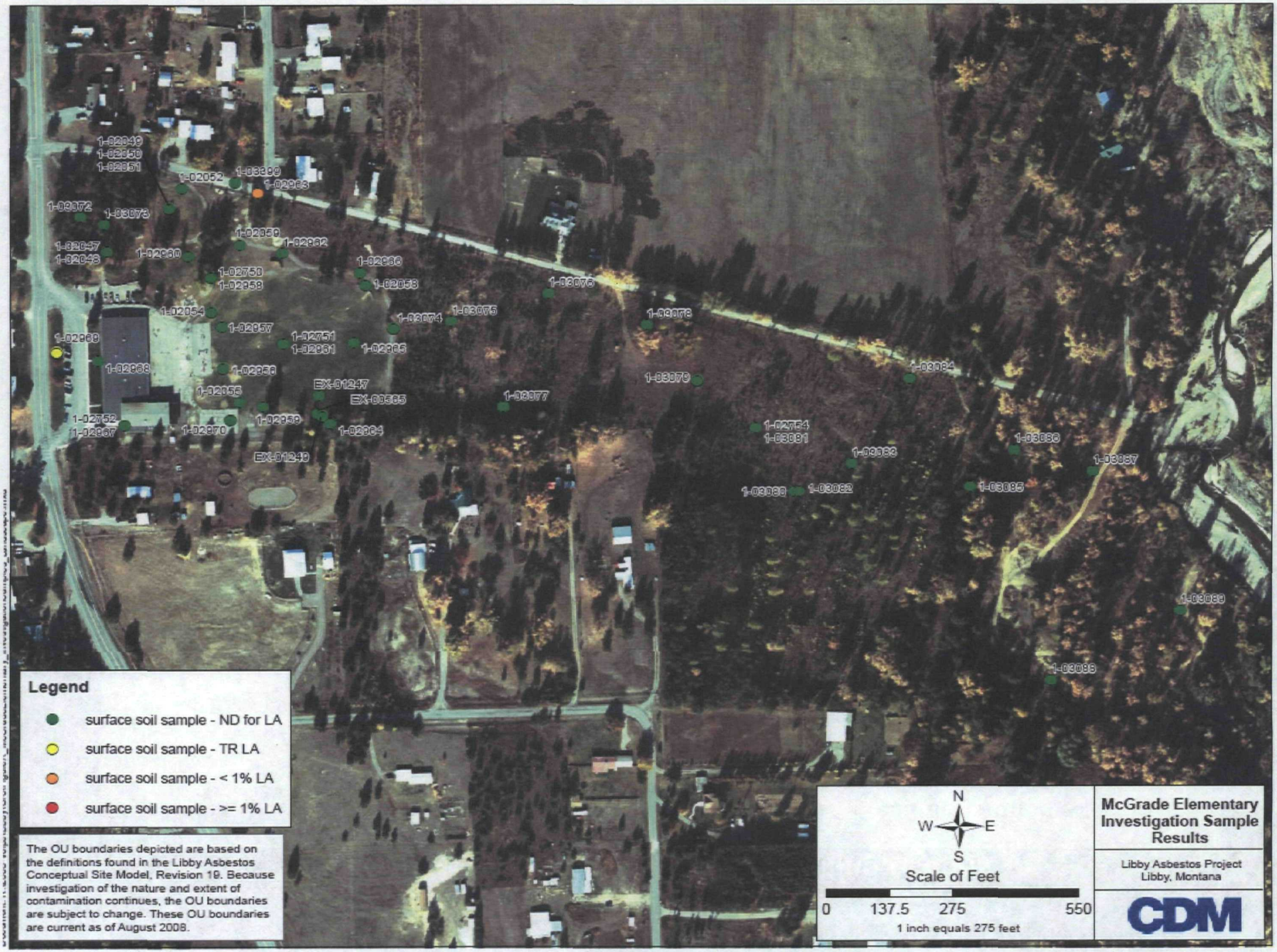


Former McGrade Elementary– Historical Investigation Results

Media	Date	# of Samples Collected	# and % of Samples with Detects				Analytical Method	Results Range	
			LA	%	C	%		LA	C
Air	1/2000	4	1	25%	0	0%	TEM ISO 10312	0.0007 S/cm^3 (1S) (Sen: 0.0007 S/cm^3)	ND (Sen: 0.0007 S/cm^3)
Bulk	No Suspect Building Material Observed								
Dust	1/2000	4	0	0%	4	100%	TEM ISO 10312	ND (Sen: 32 – 1,079 S/cm^2)	64 s/cm^2 (2S) to 56,117 s/cm^2 (52S) (Sen: 32 – 1,079 S/cm^2)
Soil	6/2001 to 8/2001	40	2	5%	0	0%	All by 9002 then NDs by PLM-VE	38 ND by PLM-VE 1 TR by PLM-VE 1 <1% by 9002	ND

Notes: LA – Libby Amphibole; C – Chrysotile; TEM – transmission electron microscopy; ISO – International Organization of Standardization; UNK – unknown; ND – Non-detect; s/cm^2 – structures per square centimeter; S – structure count; 9002 – PLM Method NIOSH 9002; PLM-VE – polarized light microscopy – visual estimation; TR – trace (<0.2%); < - less than; % - percent; Sen – analytical sensitivity; Indicates removal action taken based on result or observation.

Former McGrade Elementary – Resulting Actions		
Media	**Detection Frequency**	**Resulting Action**
Air	1/4 (Reporting Issue with Sample – Concentration Unknown)	No Action Required
Bulk	No Suspect Building Material Observed	No Action Required
Dust	0/4	No Action Required
Soil	2/40	No Action Required; Below Cleanup Criteria


1-02049
1-02050
1-02051
1-02052
1-03899
1-02963
1-03072
1-03073
1-02059
1-02962
1-02047
1-02048
1-02960
1-02750
1-02958
1-02966
1-02053
1-03076
1-02054
1-03074
1-03075
1-03078
1-02957
1-02751
1-02961
1-02965
1-02969
1-02968
1-02956
EX-01247
EX-00565
1-03077
1-02955
1-02752
1-02967
1-02970
1-02959
1-02964
EX-01249
1-03079
1-03084
1-02754
1-03081
1-03086
1-03082
1-03087
1-03080
1-03085
1-03089
1-03088
Legend
surface soil sample - ND for LA
surface soil sample - TR LA
surface soil sample - < 1% LA
surface soil sample - >= 1% LA
The OU boundaries depicted are based on the definitions found in the Libby Asbestos Conceptual Site Model, Revision 19. Because investigation of the nature and extent of contamination continues, the OU boundaries are subject to change. These OU boundaries are current as of August 2008.
N
W
E
S
Scale of Feet
0
137.5
275
550
1 inch equals 275 feet
McGrade Elementary Investigation Sample Results
Libby Asbestos Project
Libby, Montana
CDM

Libby Middle School

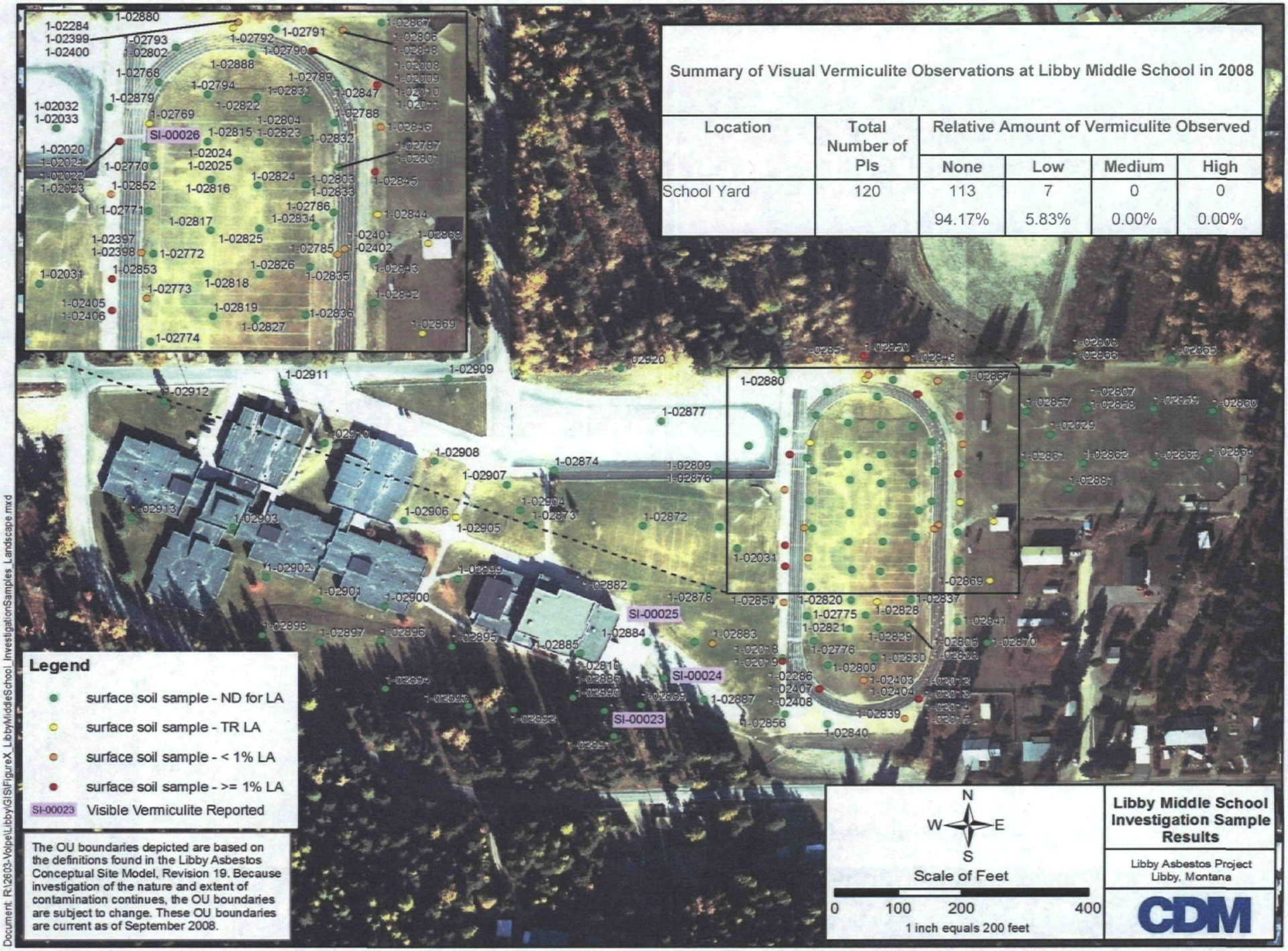
Libby Middle School – Historical Investigation Results

Media	Date	# of Samples Collected	# and % of Samples with Detects				Analytical Method	Results Range	
			LA	%	C	%		LA	C
Air	1/2000	8	0	0%	0	0%	TEM ISO 10312	ND (S: 0.0007 S/cm^3)	ND (S: 0.0007 S/cm^3)
Bulk	1/2000	No Suspect Building Material Observed							
Dust	1/2000	7	0	0%	4	57%	TEM ISO 10312	ND (S: 32 – 53,958 S/cm^2)	32 s/cm^2 (1S) to 52,879 s/cm^2 (49S) (S: 32 – 53,958 S/cm^2)
Soil	3/2001 to 6/2001	175	43	25%	0	0%	All by 9002 then NDs by PLM-VE	109 ND by PLM-VE 21 TR by 9002 9 TR by 9002 13 >1% by PLM-VE	ND

Libby Middle School – 2008 Investigation Results

Indoor Results	•Unexpanded vermiculite observed in Room 501 beneath sink, disposed of as IDW •Unexpanded vermiculite observed in Room 505 in potted plants
Outdoor Results	•Water faucet excavations: excavation inspection - no VV observed •Sprinkler system repair: excavation inspection – one flake of vermiculite observed •Playground area: samples collected (4 – ND) and VV inspections (1 "low" in each of 2 samples; 2 "lows" in one sample; 3 "lows" in one sample).

Notes: LA – Libby Amphibole; C – Chrysotile; TEM – transmission electron microscopy; ISO – International Organization of Standardization; ND – Non-detect; s/cm^2 – structures per square centimeter; S – structure count; 9002 – PLM Method NIOSH 9002; PLM-VE – polarized light microscopy – visual estimation; TR – trace (<0.2%); > - greater than; % - percent; VV – visual vermiculite; IDW – investigation derived waste; Red Font – See Removal Actions


Summary of Visual Vermiculite Observations at Libby Middle School in 2008
Location
Total Number of PIs
Relative Amount of Vermiculite Observed
None
Low
Medium
High
School Yard
120
113
94.17%
7
5.83%
0
0.00%
0
0.00%
Legend
surface soil sample - ND for LA
surface soil sample - TR LA
surface soil sample - < 1% LA
surface soil sample - >= 1% LA
SI-00023 Visible Vermiculite Reported
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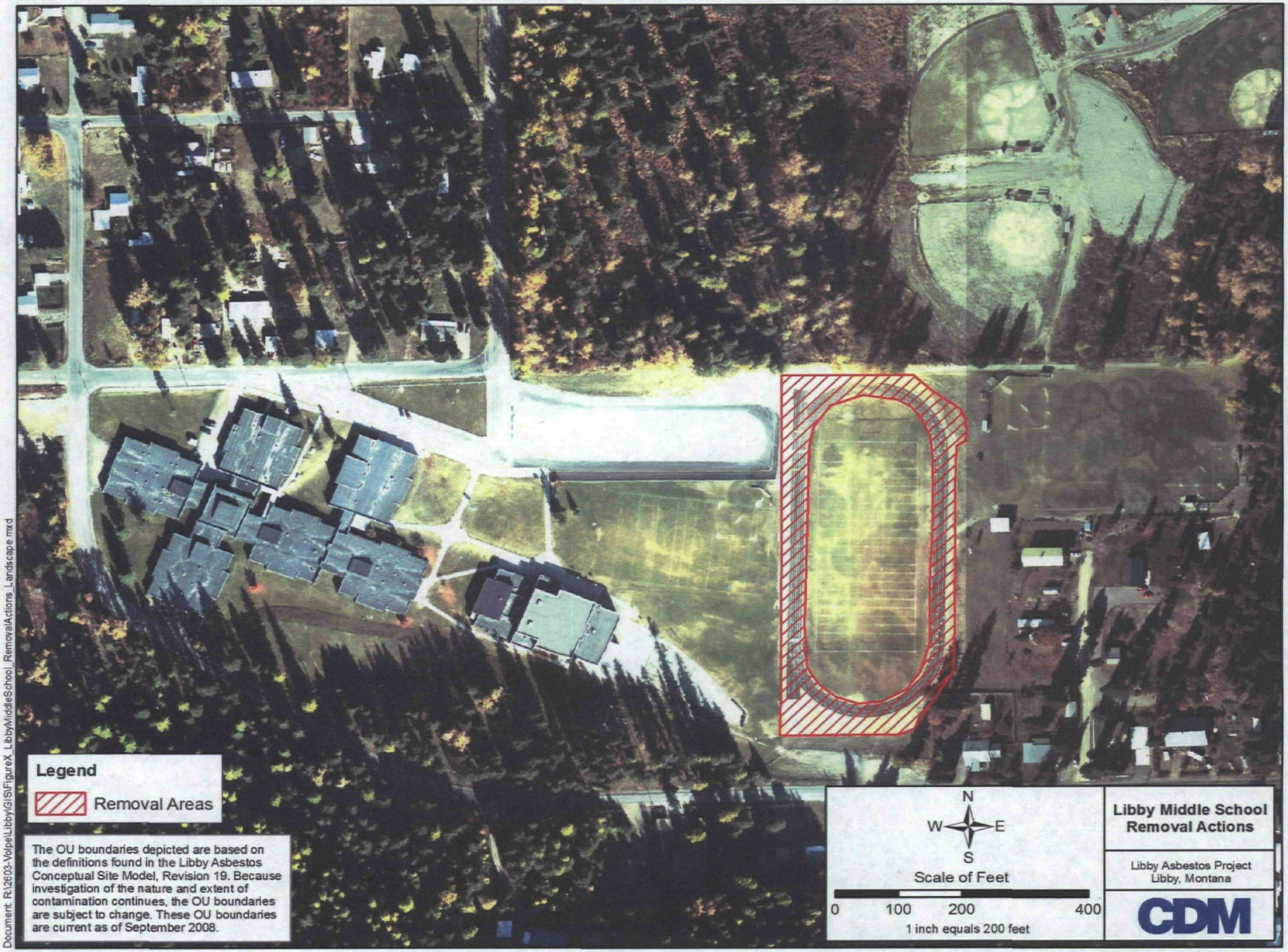
N
W
E
S
Scale of Feet
0
100
200
400
1 inch equals 200 feet
Libby Middle School Investigation Sample Results
Libby Asbestos Project
Libby, Montana
CDM
Document: R:\12603-Volpe\Libby\GIS\FigureX_LibbyMiddleSchool_InvestigationSamples_Landscape.mxd

Libby Middle School – Resulting Actions		
Media	**Detection Frequency**	**Resulting Action**
Air	0/8	No Action Required
Bulk	No Suspect Building Material Observed	No Action Required
Dust	0/7	No Action Required
Soil	43/175	August 2001: Large scale soil removal from school grounds and track area August 2004: Isolated soil removal from southeast corner of school grounds

Libby Middle School: Removal Actions

Removal action conducted at the Libby Middle School track.

Removal action conducted at the Libby Middle School track.



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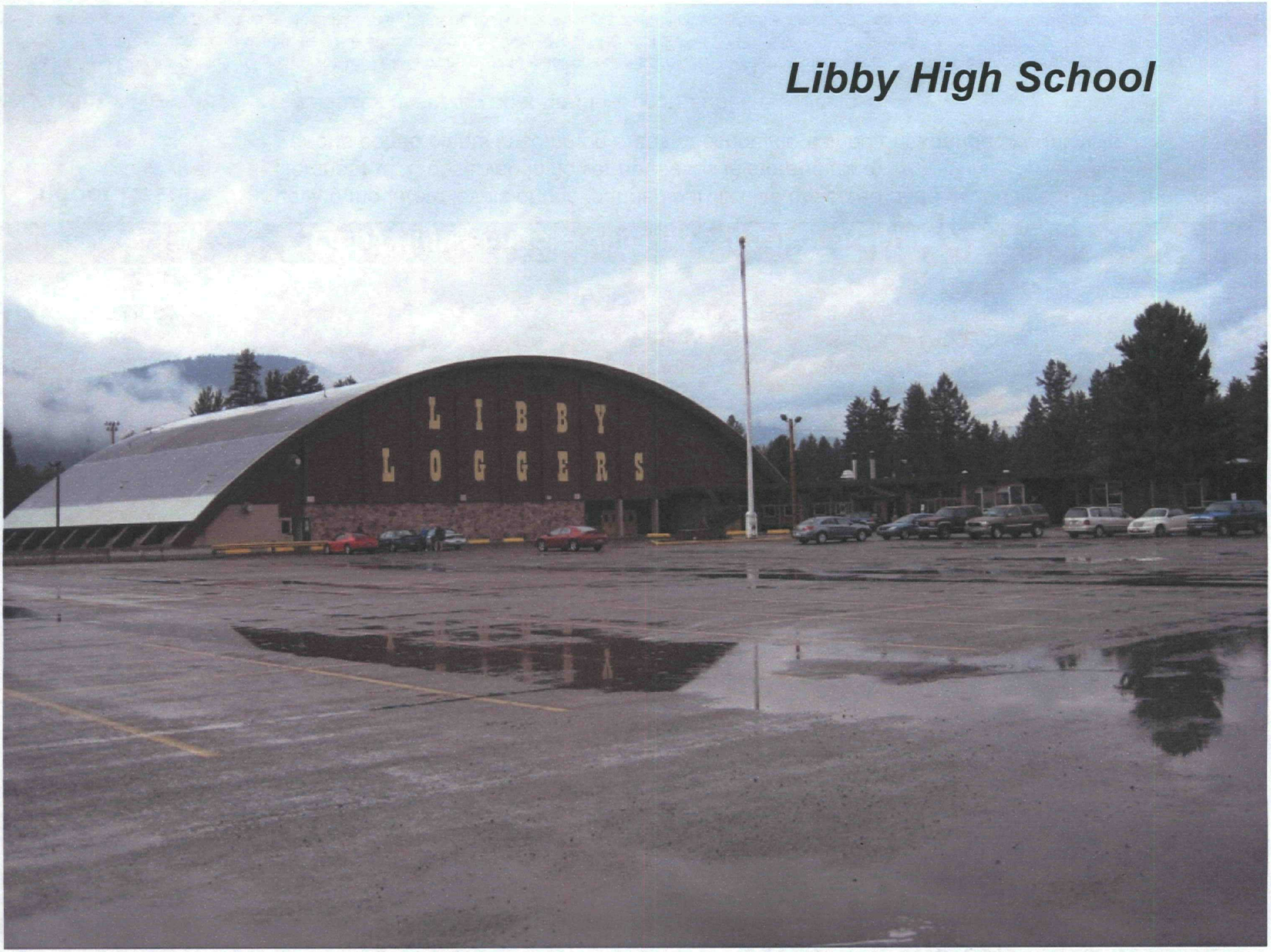

Libby High School
LIBBY
LOGGERS

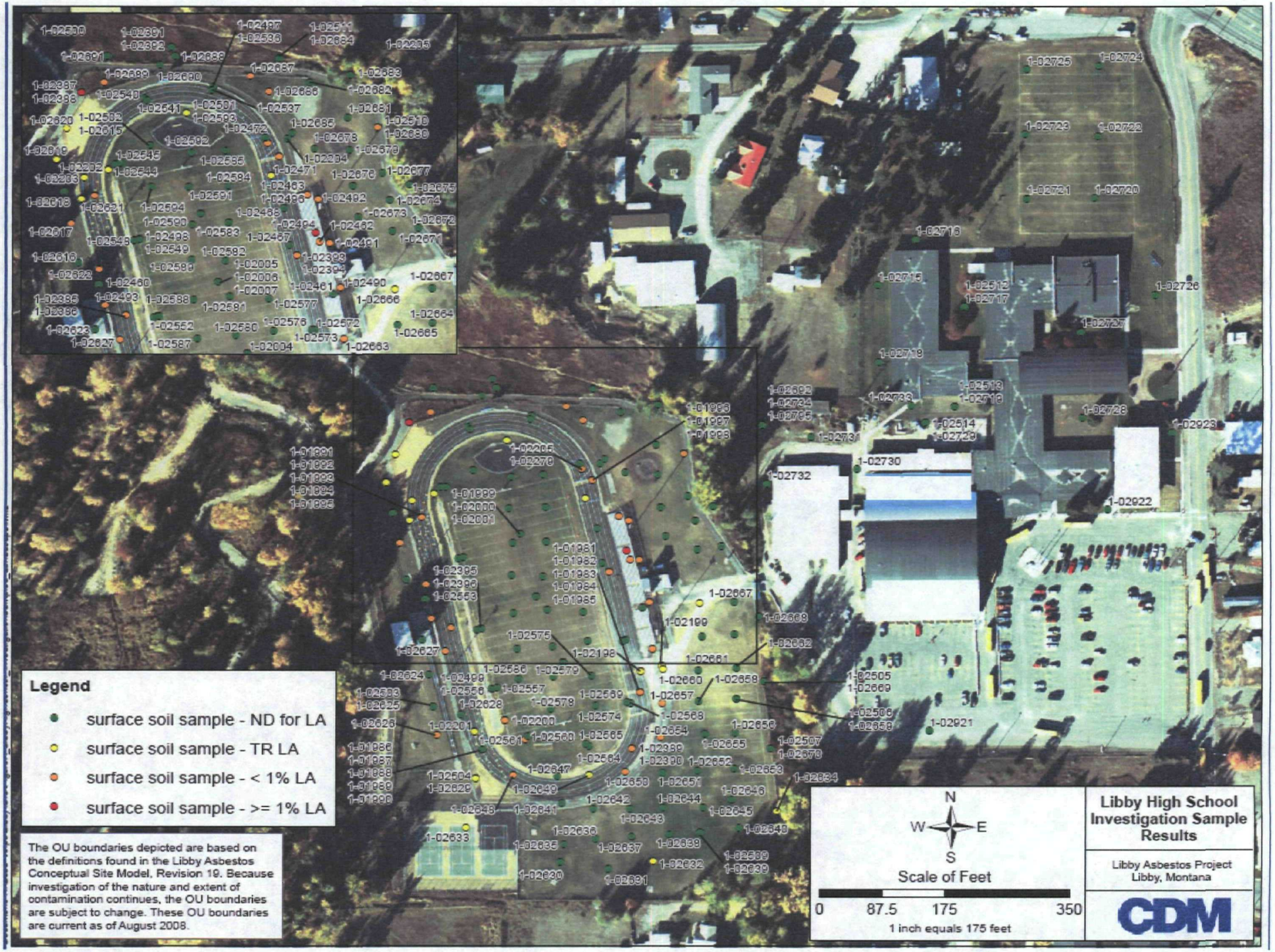
Libby High School – Historical Investigation Results

Media	Date	# of Samples Collected	# and % of Samples with Detects				Analytical Method	Results Range	
			LA	%	C	%		LA	C
Air	1/2000	11	0	0%	0	0%	TEM ISO 10312	ND (Sen: 0.0007 – 0.0008 S/cm^3)	ND (Sen: 0.0007 – 0.0008 S/cm^3)
Bulk	10/2001	4	0	0%	0	0%	9002	ND	ND
Dust	1/2000	10	1	10%	3	30%	TEM ISO 10312	322 s/cm^2 (1/S) (Sen: 32 – 26,979 S/cm^2)	322 s/cm^2 (1S) to 16,188 s/cm^2 (3S) (Sen: 32 – 26,979 S/cm^2)
	6/2001	2	1	50%	1	50%	TEM ISO 10312	42,459 s/cm^2 (3S) (Sen: 2,831 – 14,153 S/cm^2)	113,224 s/cm^2 (8S) (Sen: 2,831 – 14,153 S/cm^2)
	8/2001	4	4	100%	4	100%	TEM ISO 10312	1,132 s/cm^2 (1S) to 8,492 s/cm^2 (3S) (Sen: 566 – 2,831 S/cm^2)	1,698 s/cm^2 (3S) to 62,273 s/cm^2 (22S) (Sen: 566 – 2,831 S/cm^2)
	9/2001	2	1	50%	0	0%	TEM ISO 10312	2,831 s/cm^2 (1S) (Sen: 2,831 S/cm^2)	ND (Sen: 2,831 S/cm^2)
Soil	3/2001 to 7/2001	218	78	36%	3	1%	All by 9002 then NDs by PLM-VE	51 <1% by 9002 8 >1% by 9002 18 TR by PLM-VE 1 <1% by PLM-VE	3 <1% by 9002

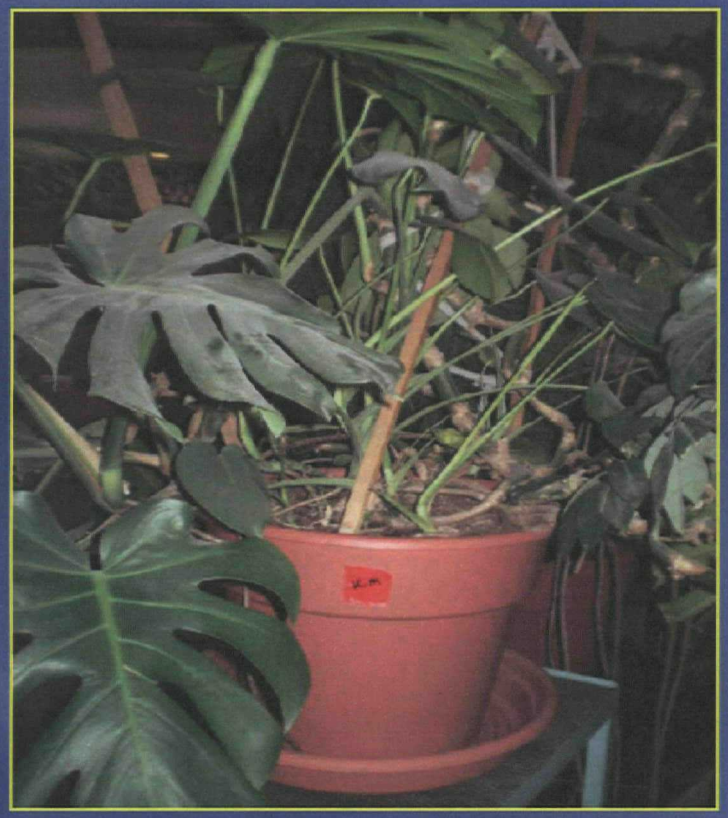
Libby High School – 2008 Investigation Results

Indoor Results	• Low to moderate levels of unexpanded vermiculite observed under wood floors of greenhouses • Remnant VCS observed in flower pot bases in storage room • Various potted plants in common areas of school contained unexpanded vermiculite
Outdoor Results	• Two flakes observed near northeast corner of the building

Notes: LA – Libby Amphibole; C – Chrysotile; TEM – transmission electron microscopy; ISO – International Organization of Standardization; ND – Non-detect; s/cm^2 – structures per square centimeter; S – structure count; 9002 – PLM Method NIOSH 9002; PLM-VE – polarized light microscopy – visual estimation; TR – trace (<0.2%); > - greater than; < - less than; % - percent; VCS – vermiculite containing soil; Sen – analytical sensitivity; Indicates removal action taken based


Legend
surface soil sample - ND for LA
surface soil sample - TR LA
surface soil sample - < 1% LA
surface soil sample - >= 1% LA
The OU boundaries depicted are based on the definitions found in the Libby Asbestos Conceptual Site Model, Revision 19. Because investigation of the nature and extent of contamination continues, the OU boundaries are subject to change. These OU boundaries are current as of August 2008.
N
W
E
S
Scale of Feet
0
87.5
175
350
1 inch equals 175 feet
Libby High School Investigation Sample Results
Libby Asbestos Project
Libby, Montana
CDM

Libby High School: 2008 Observations



Potted plant stored in common area with moderate amounts of vermiculite observed.

Vermiculite observed beneath floorboards of greenhouse.

Libby High School – Resulting Actions		
Media	**Detection Frequency**	**Resulting Action**
Air	0/11	No Action Required
Bulk	0/4	No Action Required
Dust	7/18	June 2001: Football field storage building cleaned and new equipment purchased August 2001: Snack bar, press box, visitor's coach box, and storage garage cleaned September 2001: Visitor's side bleachers cleaned
Soil	78/218	June 2001: Large scale soil removal from track area and from a portion of the tennis courts

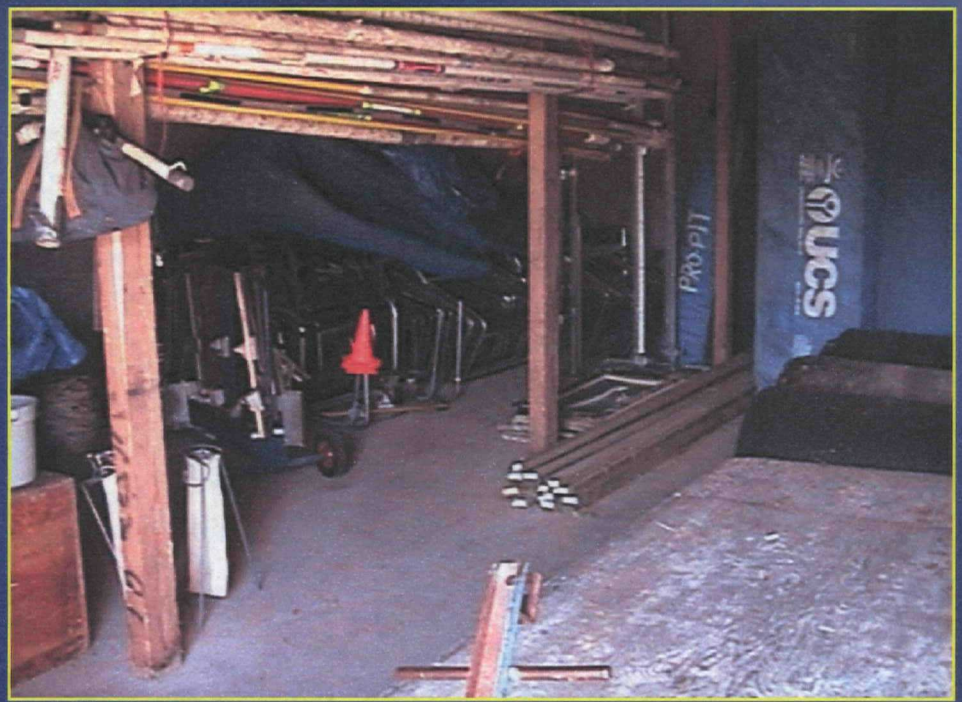
Libby High School: Removal Actions

Removal of long jump pit and runway.

Removal of portion of tennis court. Vermiculite and mine tailings were "chased" and found to be sub-base for the tennis courts.

Libby High School: Removal Actions

Press box that required interior cleaning due to LA observed in dust samples.

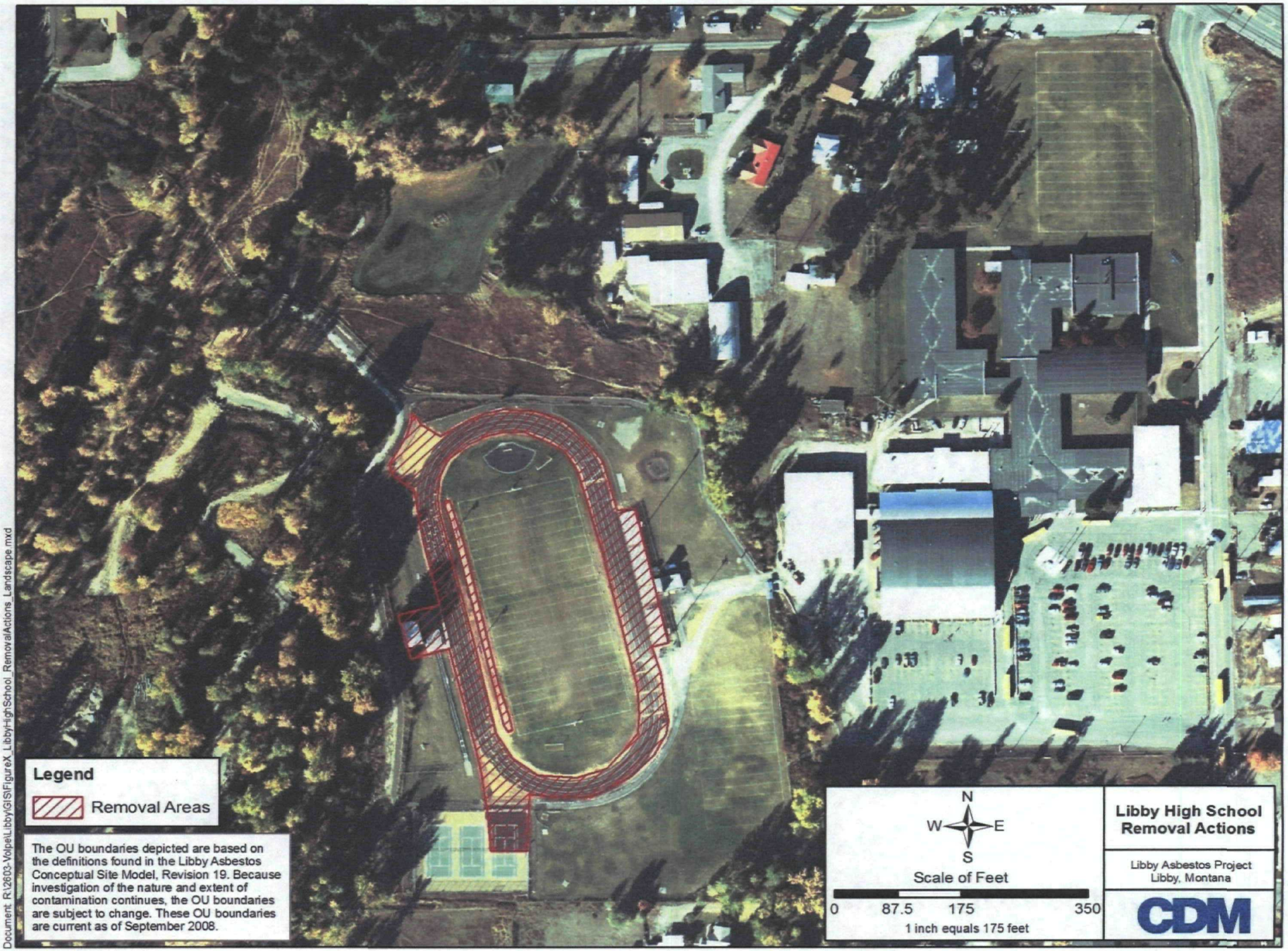


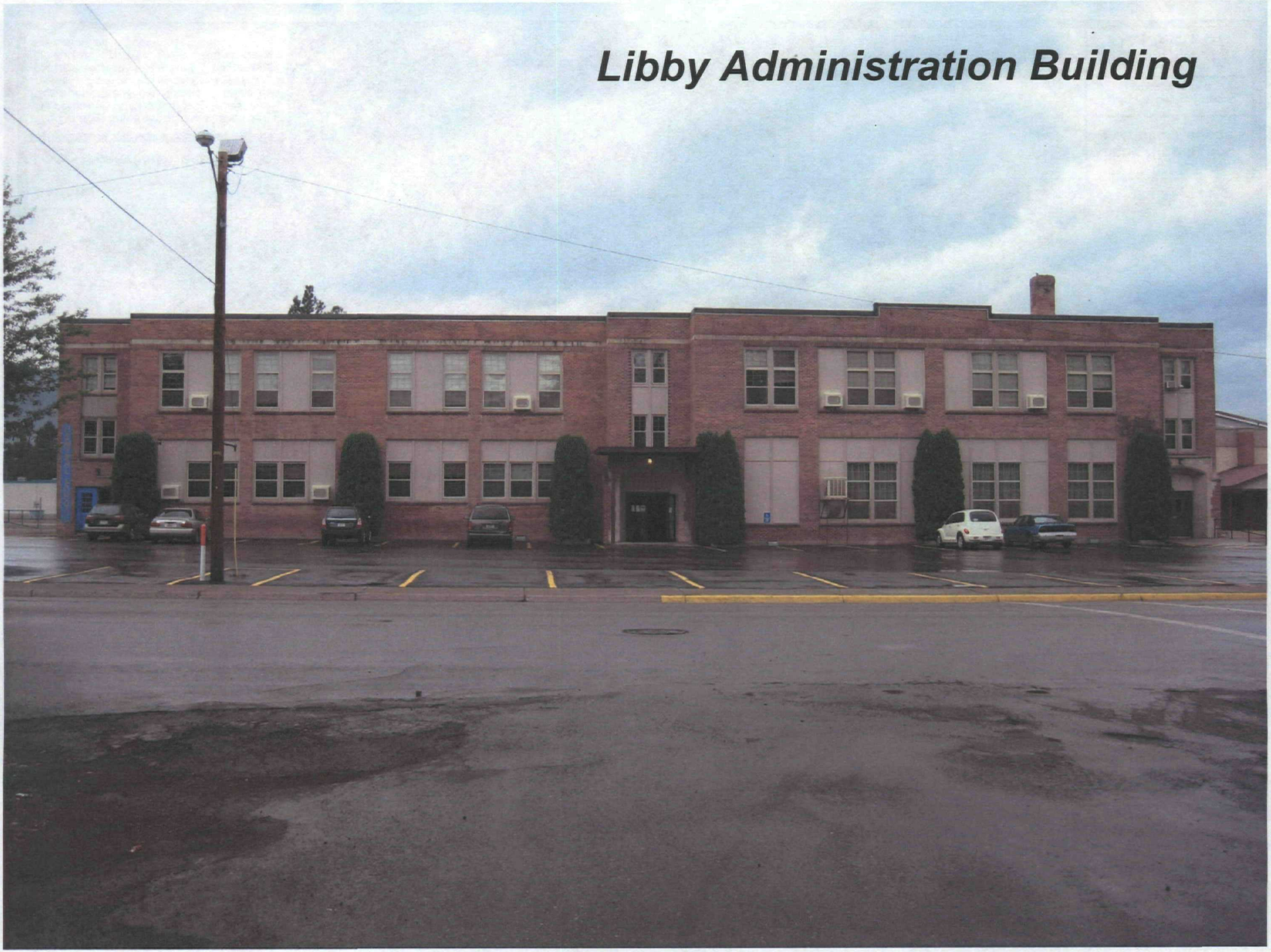
Equipment storage area that required interior cleaning due to LA observed in dust samples.

Libby High School: Removal Actions

Cleaning of bleachers resulting from LA observed in dust samples.

Soil removal completed under bleachers.


Legend
Removal Areas
The OU boundaries depicted are based on the definitions found in the Libby Asbestos Conceptual Site Model, Revision 19. Because investigation of the nature and extent of contamination continues, the OU boundaries are subject to change. These OU boundaries are current as of September 2008.
N
W
E
S
Scale of Feet
0
87.5
175
350
1 inch equals 175 feet
Libby High School Removal Actions
Libby Asbestos Project
Libby, Montana
CDM
Document: R:\2603-Volpe\Libby\GIS\FigureX_LibbyHighSchool_RemovalActions_Landscape.mxd


Libby Administration Building

Libby Administration Building – Historical Investigation Results

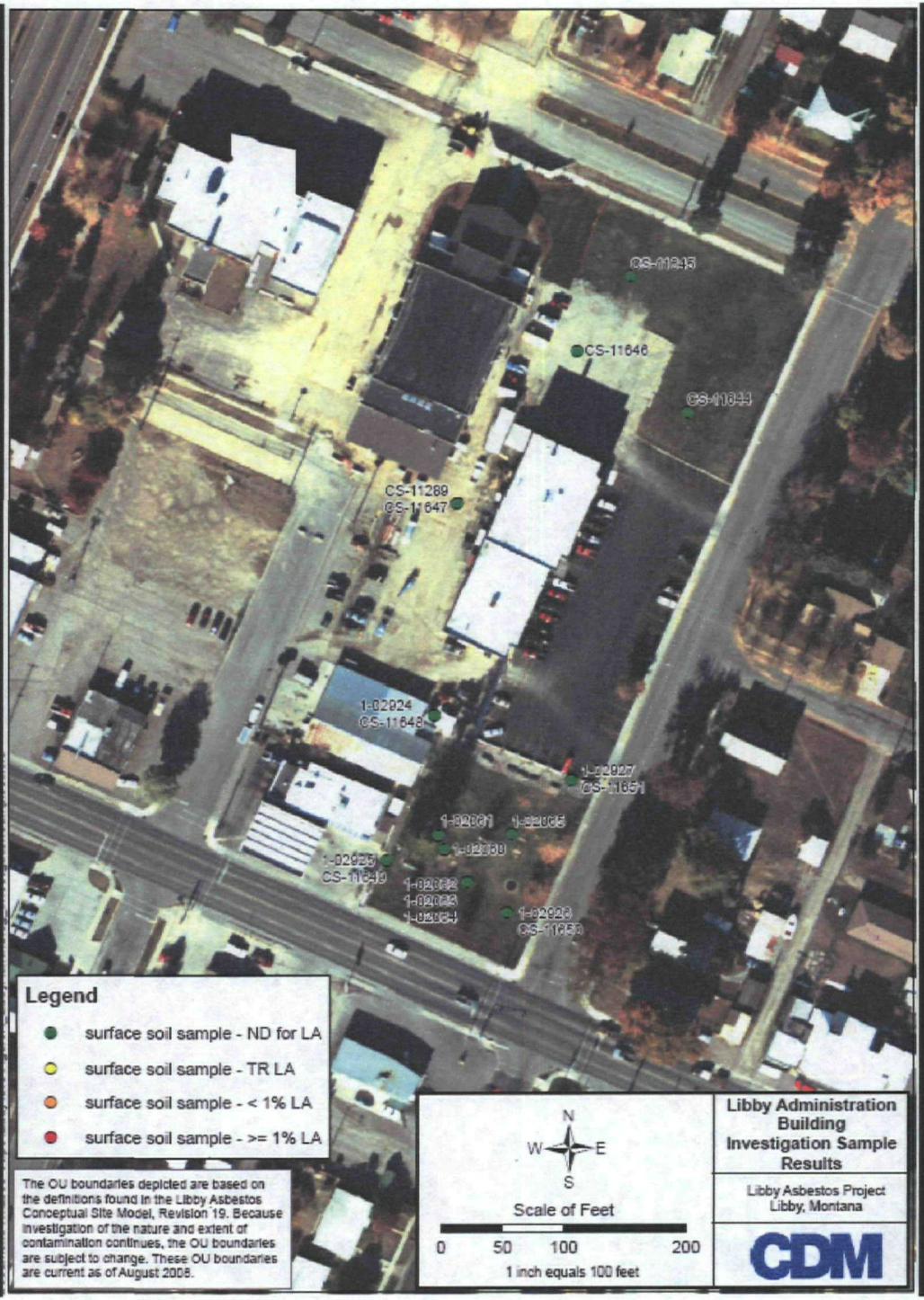
Media	Date	# of Samples Collected	# and % of Samples with Detects				Analytical Method	Results Range	
			LA	%	C	%		LA	C
Air	1/2000	5	1	20%	2	40%	TEM ISO 10312	0.0008 s/cm³ (1S) (Sen: 0.0005 – 0.0007 S/cm³)	1.1274 s/cm³ (2S) to 1.6211 s/cm³ (2S) (Sen: 0.0005 – 0.0007 S/cm³)
Bulk	6/2001	7	2	29%	0	0%	9002	<1%	ND
Dust	1/2000	5	0	0%	4	80%	TEM ISO 10312	ND (Sen: 32 S/cm²)	258 s/cm² (8S) to 644 s/cm² (20S) (Sen: 32 S/cm²)
	6/2001	2	0	0%	0	0%	TEM ISO 10312	ND (Sen: 566 S/cm²)	ND (Sen: 566 S/cm²)
	4/2003	10	0	0%	0	0%	TEM ISO 10312	ND (Sen: 73 - 293 S/cm²)	ND (Sen: 73 - 293 S/cm²)
	6/2003	3	0	0%	0	0%	TEM ISO 10312	ND (Sen: 146 - 585 S/cm²)	ND (Sen: 146 - 585 S/cm²)
Soil	3/2001	6	0	0%	0	0%	All by 9002 then NDs by PLM-VE	ND	ND
	6/2001	7	0	0%	0	0%	All by 9002 then NDs by PLM-VE	ND	ND
	4/2003	7	0	0%	0	0%	PLM-VE	ND	ND

Libby Administration Building – 2008 Investigation Results

Indoor Results	•VCI was not observed •VCBM in the form of plaster was observed in the second floor storage room. The material was found in good condition and was not friable.
Outdoor Results	•VCI was not observed

Notes: LA – Libby Amphibole; C – Chrysotile; TEM – transmission electron microscopy; ISO – International Organization of Standardization; ND – Non-detect; s/cm² – structures per square centimeter; S – structure count; 9002 – PLM Method NIOSH 9002; PLM-VE – polarized light microscopy – visual estimation; < - less than; % - percent; VCBM – vermiculite containing building material; Sen – analytical sensitivity

Libby Administration Building – Resulting Actions		
Media	**Detection Frequency**	**Resulting Action**
Air	1/5	No Action Required
Bulk	2/7	No Action Required VCI Reported in Attic; Cleaned
Dust	0/20	No Action Required
Soil	0/20	No Action Required


CS-11645
CS-11646
CS-11644
CS-11289
CS-11647
1-02924
CS-11648
1-02927
CS-11651
1-02925
CS-11649
Legend
surface soil sample - ND for LA
surface soil sample - TR LA
surface soil sample - < 1% LA
surface soil sample - >= 1% LA
The OU boundaries depicted are based on the definitions found in the Libby Asbestos Conceptual Site Model, Revision 19. Because investigation of the nature and extent of contamination continues, the OU boundaries are subject to change. These OU boundaries are current as of August 2008.
N
W
E
S
Scale of Feet
0
50
100
200
1 inch equals 100 feet
Libby Administration Building Investigation Sample Results
Libby Asbestos Project
Libby, Montana
CDM

Libby Administration Building: Removal Actions

Attic before removal action was completed.

Vermiculite observed in the storage room.

Proposed Future Sampling

Proposed Sampling				
Location	**Sampling Strategy**	**Decision**		
Indoor	Stationary Air (During School Hours)	Greater Than Risk Based Concentration = Action		
	Limited Personal Air (EPA Contractors over Weekends)			
Outdoor	Soil Sampling and Visual Vermiculite Observations	**PLM**	**VIS**	No Action Required
		-	-	
		+	-	ABS or Other Action
		-	+	
		+	+	